

OFFSHORE WIND FARMS IN THE GERMAN NORTH SEA /BALTIC SEA

NORTH SEA

No.	Project name	Cluster on map/ Cluster Tennenet	Location	Developer/Operator	Turbine Type (Planned)	Number of WTG (Planned)	Total output [MW] (Planned)	Commissioning (Planned)	Distance to nearest coast [Km]	Water depth [m]
■ Operational (16)										
1	alpha ventus	2	EEZ	DOTI (Deutsche Offshore Testfeld- und Infrastruktur GmbH & Co. KG (E.ON, EWE, Vattenfall))	6 x REpower 5M, 6 x AREVA Wind M5000 - 116	12	60	2010	60	30
6	Amrumbank West	4/HelWin	EEZ	E.ON climate renewables / Amrumbank West GmbH	Siemens SWT-3.6-120	80	302	2015	57-67	20-24
2	BARD Offshore 1	6/BorWin	EEZ	Ocean Breeze Energy (100% UniCredit Bank AG)	Bard 5.0	80	400	2013	101	40
3	Borkum Riffgat		12 NM-Zone	EWE ERNEUERBARE ENERGIEN	Siemens SWT-3.6-120	30	113	2014	22	20-23
7	Borkum Riffgrund 1	2/DolWin	EEZ	DONG Energy/Kirkbi A/S, William Demant Invest A/S	Siemens SWT-3.6-120 V3	78	312	2015	34-43	23-28
8	Dan Tysk	5/SylWin	EEZ	Dan Tysk Offshore Wind, (Vattenfall Europe Windkraft 51%, Stadtwerke München 49%)	Siemens SWT-3.6-120	80	288	2015	91	21-32
4	Enova Offshore Ems-Emden (repowered)		12 NM-Zone	EWE ERNEUERBARE ENERGIEN	Enercon E112	1	4.5	2004	0.1	3
9	Global Tech I	8/BorWin	EEZ	Global Tech I Offshore Wind GmbH (Stadtwerke München, Entega AG, Axpo International, Exportes Offshore, Norderland, Windreich, FC Wind 1/2, GTU I / II)	AREVA Wind M5000 - 116	80	400	2015	105-115	38-39
10	Meerwind Ost	4/HelWin	EEZ	WindMW (China Three Gorges Corporation (CTG)/Windland)	Siemens SWT-3.6-120	40	144	2014	20-30	22-29
11	Meerwind Süd	4/HelWin	EEZ	WindMW (China Three Gorges Corporation (CTG)/Windland)	Siemens SWT-3.6-120	40	144	2014	20-30	22-29
12	Nordsee Ost	4/HelWin	EEZ	RWE Innogy	Servion 6.2M-126	48	295	2015	40-65	22-26
13	Trianel Windpark Borkum (Borkum West II, 1. Phase)	2/DolWin	EEZ	Trianel Windkraftwerk Borkum GmbH & Co. KG	AREVA Wind M5000 - 116	40	200	2015	20-30	26-32
19	Butendiek	5/Sylwin	EEZ	wpd, Marguerite Fund, Industriens Pension, PKA, Siemens, CDC, EWZ	Siemens SWT-3.6-120	80	288	2015	52-58	17-22
25	Gode Wind 01	3/DolWin	EEZ	DONG Energy	Siemens SWT-6.0-154	55	330	2016	32-41	28-33
26	Gode Wind 02	3/DolWin	EEZ	DONG Energy	Siemens SWT-6.0-154	42	252	2017	38-44	32-34
35	Sandbank	5/SylWin	EEZ	Vattenfall Europe Windkraft, Stadtwerke München	Siemens SWT-4.0-130	72	288	2017	112-123	24-34
Summary						858	3,820.5			

■ To be commissioned until 2020 (9)										
30	Nordergründe*		12 NM-Zone	wpd, John Laing Group plc	Servion 6.2M-126	18	112		16	3-10
31	Veja Mate*	6/BorWin	EEZ	Highland Group, Siemens Financial Services and Copenhagen Infrastructure Partners	SWT 6.0-154	67	402		87-99	39-40
32	Nordsee One* (formerly Innogy Nordsee 1)	3/DolWin	EEZ	Northland Power Inc.	Servion 6.2M-126	54	332		45	26-29
15	Albatros	8/BorWin	EEZ	EnBW Energie Baden-Württemberg		16	50		93	40
16	Borkum Riffgrund II	2/DolWin	EEZ	DONG Energy Borkum Riffgrund II GmbH	V-164-8.0	56	448		34	23-29
18	Trianel Windpark Borkum, Bauphase 2	2/DolWin	EEZ	Trianel Windkraftwerk Borkum GmbH & Co. KG	Servion 6.2M152	32	200		45	25-35
22	Deutsche Bucht	6/BorWin	EEZ	Northland Power Inc.		42	252		87	39-41
24	EnBW Hohe See	8/BorWin	EEZ	EnBW Hohe See GmbH & Co. KG	SWT-7.0-154	71	497		73	26-39
29	Merkur Offshore (formerly MEG 1)	2/DolWin	EEZ	Partners Group, InfraRed Capital Partners, Deme-Gruppe, GE Financial Service, ADEME	Haliade 150-6.0MW	66	396		45	27-33
Summary						422	2,689			

■ Wind farms to be implemented from 2021 (Successful bidders) (4)										
23	EnBW He Dreih	7/BorWin	EEZ	EnBW He Dreih GmbH		119	900		85	37-41
27	Gode Wind III	3/DolWin	EEZ	Gode Wind 03 GmbH (Dong Energy)		14	110		41	28-34
47	Borkum Riffgrund West II	1/DolWin	EEZ	DONG Energy Borkum Riffgrund West II GmbH		43	240		52	29-33
81	OWP West	1/DolWin	EEZ	Dong Energy		41	240		58	29-33
Summary						217	1,490			

■ Licensed wind farms eligible for tender 2018 (11)										
17	Borkum Riffgrund West I	1/DolWin	EEZ	DONG Energy Borkum Riffgrund West I GmbH		80	400		40	30-35
20	OWP Delta Nordsee 1	3/DolWin	EEZ	OWP Delta Nordsee GmbH (E.ON Climate & Renewables)		47	240		40	29-35
21	OWP Delta Nordsee 2	3/DolWin	EEZ	OWP Delta Nordsee GmbH (E.ON Climate & Renewables)		32	160		40	29-35
26a	Gode Wind 04	3/DolWin	EEZ	Gode Wind II GmbH (Dong Energy)		42				29-34
33	Nördlicher Grund (64 WEA)	5/SylWin	EEZ	Nördlicher Grund GmbH (DONG Energy)		64	320		86	21-33
35a	Nördlicher Grund Teil Sandbank	5	EEZ	Vattenfall Europe Windkraft GmbH		16				
36	Nordsee Two	3/DolWin	EEZ	Nordsee Two GmbH (Northland Power)		48	295			30-33
37	Nordsee Three	3/DolWin	EEZ	Nordsee Three GmbH (Northland Power)		60	369			29-35
41	Atlantis I (formerly Aquamarin)	6/BorWin	EEZ	PNE Wind Atlantis I GmbH (veräußert an Vattenfall, Jan. 2017)		73	400		84	38
58	Global Tech II	7/BorWin	EEZ	Vattenfall Global Tech 2 Offshore Wind GmbH		79	380		70	37-39
74	Kaskasi II (formerly Hochsee Testfeld Helgoland HTH)	4/HelWin	EEZ	RWE Innogy		34	210		48	22-24
Summary						496	2,394			
Total projects in the North Sea						Summary		1,993	10,393.5	

* Under Construction

BALTIC SEA

No.	Project name	Cluster on map	Location	Developer/Operator	Turbine Type (Planned)	Number of WTG (Planned)	Total output [MW] (Planned)	Commissioning (Planned)	Distance to nearest coast [Km]	Water depth [m]
■ Operational (3)										
106	Breitting / Rostock		12 NM-Zone	WIND-projekt	Nordex N90/2500	1	2.5	2006	0.5	2
107	Baltic 1		12 NM-Zone	EnBW Erneuerbare Energien GmbH and 19 municipal utilities	Siemens SWT-2.3-93	21	48.3	2011	16	16-19
108	Baltic 2	3	EEZ	EnBW Ostsee Offshore GmbH / Macquarie Capital	Siemens SWT-3.6-120	80	288	2015	57-65	23-44
Summary						102	338.8			

■ To be commissioned until 2020 (3)										
111	Wikinger* (formerly Ventotec Ost 2)	1	EEZ	Iberdrola Renovables Offshore Deutschland	Adwen AD 5-135	70	354		73-82	37-43
	GICON-SOF		12 NM-Zone	ESG Edelstahl und Umwelttechnik Stralsund GmbH	Siemens SWT-2.3-93	1	2.3		21	18
109	Arkona Becken Südost	1	EEZ	Arkona-Windpark Entwicklungs GmbH (E.ON Climate & Renewables)	SWT-6.0-154	60	385		34	21-38
Summary						131	741.3			

■ Licensed wind farms eligible for tender 2018 (8)										
112	Adlergrund 500	1	EEZ	Adlergrund 500 GmbH		20			40	34-37
113	Adlergrund GAP	1	EEZ	BEC Energie Consult GmbH		39			36	36-41
115	ARCADIS OST 1		12 NM-Zone	KNK Wind, WV Energie, Innsbrucker Kommunalbetriebe, Stadtwerke Bad Vilbel, 25 more municipal utilities	Haliade 150-6.0MW	58	348		19	41-46
121	Baltic Eagle	2	EEZ	Baltic Eagle GmbH		80			30	41-44
125	Ostseeschatz	2	EEZ	Financial Insurance GmbH		42	252		30	44
130	Wikinger Nord	1	EEZ	Iberdrola Renovables Offshore Deutschland GmbH		8				
131	Wikinger Süd	1	EEZ	Iberdrola Renovables Offshore Deutschland GmbH		18				
132	Windanker	1	EEZ	Iberdrola Renovables Offshore Deutschland GmbH		57	342		42	41-48
Summary						322	942			
Total projects in the Baltic Sea						Summary		555	2,021.8	

* Under Construction



The MPI Enterprise loaded with tower, nacelle and rotor-blades from Servion on its way to installation in the wind farm Nordergründe.
Photo: wpd onshore GmbH & Co. KG (Photographer: Ulrich Wirwa)

Grid Connections (North Sea/Baltic Sea)

Projekt	Converter platform	Status	Capacity [MW] (Planned)	Connecting Offshore Wind Farms (number on map) (final without interim)	Offshore Substation supplier	Operator/Investor	Commissioning	Planned Commissioning
NOR-0-1		■	113	(3) Borkum Riffgat	NKT Cables	TenneT	2014	
NOR-2-1		■	62	(1) alpha ventus	Transpower Offshore	TenneT	2009	
NOR-2-2 (DolWin1)	DolWin alpha	■	800	(7) Borkum Riffgrund 1, (13) Trianel Windpark Borkum (Borkum West II, 1. Phase), (18) Trianel Windpark Borkum, Bauphase 2	ABB	TenneT	2015	
NOR-4-1 (HelWin1)	HelWin alpha	■	576	(10) Meerwind Ost, (11) Meerwind Süd, (12) Nordsee Ost	Siemens/Prysman	Tennet	2015	
NOR-4-2 (HelWin2)	HelWin beta	■	690	(6) Amrumbank West	Siemens/Prysman	TenneT Holding B.V., Option: Mitsubishi Corporation (MC) (Stand: Jan2013)	2015	
NOR-5-1 (SylWin1)	SylWin alpha	■	864	(19) Butendiek, (8) Dan Tysk, (35) Sandbank	Siemens/Prysman	Tennet	2015	
NOR-6-1 (BorWin1)	BorWin alpha	■	400	(2) BARD Offshore 1	ABB	TenneT Holding B.V., Mitsubishi Corporation (MC)	2010	
NOR-6-2 (BorWin2)	BorWin beta	■	800	(15) Albatros, (22) Deutsche Bucht, (31) Veja Mate	Siemens/Prysman	TenneT Holding B.V., Mitsubishi Corporation (MC)	2015	
OST-3-1		■	51	(107) Baltic 1, GICON-SOF	NKT Cables	50hertz	2011	
OST-3-2		■	288	(108) Baltic 2	NSW	50hertz	2015	
NOR-0-2		■	111	(30) Nordergründe	ABB	TenneT		2017
NOR-2-3 (DolWin3)	DolWin gamma	■	900	(16) Borkum Riffgrund II, (29) Merkur Offshore	Alstom	TenneT Offshore GmbH		2017
NOR-3-1 (DolWin2)	DolWin beta	■	916	(25) Gode Wind 01, (26) Gode Wind 02, (32) Nordsee One	ABB	TenneT Holding B.V., Option: Mitsubishi Corporation (MC) (Status: Jan 2013)		2017
NOR-8-1 (BorWin3)	BorWin gamma	■	900	(24) EnBW Hohe See, (9) Global Tech I	Siemens/Petrofac/Prysman			2019
OST-1-1		■	250	(111) Wikinger	Prysman			2018
OST-1-2		■	250	(109) Arkona Becken Südost	Prysman			2019
OST-1-3		■	250	(111) Wikinger	Prysman			2019
OST-2-1		■	250					2021
OST-2-2		■	250					2021
OST-2-3		■	250					2022
NOR-3-3 (DolWin6)	DolWin zeta	■	900					2023
NOR-5-2 (SylWin2)	SylWin beta	■	900					2025
NOR-1-1 (DolWin5)	DolWin epsilon	■	900					2024
NOR-7-1 (BorWin5)	BorWin epsilon	■	900					2025
NOR-11-1		■	900					2032
NOR-12-1		■	900					2034
NOR-13-1		■	900					2031
NOR-3-2 (DolWin4)	DolWin delta	■	900					2028
NOR-6-3 (BorWin4)	BorWin delta	■	900					2029
NOR-7-2 (BorWin6)	BorWin zeta	■	900					2030
NOR-9-1		■	900					2035
OST-8-2		■	500					2029

Interconnector [DC]	Demand [MW]	Status	Between countries	Cable Supplier	Operator/Investor	Planned commissioning
COBRA Cable	700	■	Denmark (Endrup) / Netherland (Eemshaven)	Prysman	TenneT TSO, energienet.dk	2019
Nord Link	1,400	■	Germany (Wilster) / Norway (Tonstad)	ABB/Nexans	Statnett, TenneT, KfW	2020
Viking Link	1,400	■	Denmark (Revsing) / UK (Bicker Fen)	not decided	National Grid Interconnector Holding Limited, energienet.dk	2022
Kriegers Flak	400	■	Denmark (Ishøj/Bjæverskov) / Germany (Bentwisch)	nkt cables	50HERTZ, Energinet.dk	2018

■ Operational ■ (Soon) under construction ■ Confirmed ■ Undergoing licensing procedures/discussed □ Planned

MW = megawatts, WTG = wind turbine generator, 12 NM zone = 12 nautical mile zone (coastal seas) in Germany licensed by German states
EEZ = German Exclusive Economic Zone (from 12 to 200 nautical miles from the coast); in Germany licensed by: German Maritime and Hydrographic Agency (Bundesamt für Seeschifffahrt und Hydrographie, BSH)

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May 2017



www.wab.net

